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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Klaus Schweitzer ProPat 425 C South Sharon Amity Road Charlotte, NC 28211			EXAMINER BLAND, LAYLA D	
			ART UNIT 1623	PAPER NUMBER
			MAIL DATE 06/01/2009	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/524,455

**Applicant(s)**

PERPLIES ET AL.

**Examiner**

LAYLA BLAND

**Art Unit**

1623

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 4, 6-9, 11, 12, 14 and 15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4, 6-9, 11, 12, 14, 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

This office action is a response to Applicant's amendment submitted February 28, 2009, wherein claims 1, 11, 14, and 15 are amended and claims 2, 3, 5, 10, and 13 are canceled. Claims 1, 4, 6-9, 11, 12, 14, and 15 are pending and are examined on the merits herein.

In view of the cancellation of claims 3 and 13, all rejections made with respect to those claims in the previous office action are withdrawn.

In view of Applicant's amendment submitted February 28, 2009, the rejection of claims 1, 6-9, and 11-15 under 35 USC 112, first paragraph, for failing to comply with the written description requirement is withdrawn. The amended claims are limited to compounds of the formula  $\text{HOC-[X]}_y\text{-COOH}$ .

In view of Applicant's amendment submitted February 28, 2009, the rejection of claims 1, 6-9, and 11-15 under 35 U.S.C. 112, second paragraph, as being indefinite with respect to "chemical compounds containing at least one aldehyde group and at least one acid group," is withdrawn. The amended claims are limited to compounds of the formula  $\text{HOC-[X]}_y\text{-COOH}$ .

The following new rejections were necessitated by Applicant's amendment submitted February 29, 2009, wherein the limitations "containing said reversibly crosslinked cellulose ether as a sole viscosity developer" and "a minimum of a few seconds" were added to independent claim 1.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 4, 6-9, 11, 12, 14, and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In Applicant's amendment submitted February 29, 2009, the limitations "containing said reversibly crosslinked cellulose ether as a sole viscosity developer" and "a minimum of a few seconds" were added to independent claim 1.

The specification as originally filed does not provide support for the limitation "a sole viscosity developer." Applicant states that support for this amendment is on page 6, lines 9-13 and page 7, lines 16-22 of the specification. Page 6, lines 9-13 does not mention the presence or absence of another viscosity developer. Page 7, lines 16-22 is drawn to an exemplary preparation of a crosslinked cellulose ether but also does not mention its inclusion as a sole viscosity developer in an aqueous solution.

The specification as originally filed does not provide support for preparation of a crosslinked cellulose ether which has a solvation delay with no upper limit. The specification provides support for a solvation delay of "a plurality of hours," and

exemplifies solvation delays up to about five minutes, but does not provide support for unlimited solvation delay.

This is a new matter rejection.

The following rejections are maintained:

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 4, 6-9, 11, 12, 14, and 15 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the production of reversibly crosslinked cellulose ethers having solvation delay of up to five minutes, does not reasonably provide enablement for reversibly crosslinked cellulose ethers having solvation delay of a minimum of a few seconds, with no upper limit. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims.

The factors to be considered in determining whether a disclosure meets the enablement requirements of 35 U.S.C. 112, first paragraph, have been described in *In re Wands*, 858 F.2d 731, 8 USPQ2d 1400 (Fed. Cir., 1988). The court in *Wands* states, "Enablement is not precluded by the necessity for some experimentation, such as routine screening. However, experimentation needed to practice the invention must not be undue experimentation. The key word is 'undue', not 'experimentation'" (*Wands*, 8

USPQ2sd 1404). Clearly, enablement of a claimed invention cannot be predicated on the basis of quantity of experimentation required to make or use the invention.

"Whether undue experimentation is needed is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual considerations" (*Wands*, 8 USPQ2d 1404). Among these factors are: (1) the nature of the invention; (2) the breadth of the claims; (3) the state of the prior art; (4) the predictability or unpredictability of the art; (5) the relative skill of those in the art; (6) the amount of direction or guidance presented; (7) the presence or absence of working examples; and (8) the quantity of experimentation necessary.

While all of these factors are considered, a sufficient amount for a *prima facie* case is discussed below.

*(1) The nature of the invention and (2) the breadth of the claims:*

The claims are drawn to a method for producing reversibly crosslinked cellulose ethers having wherein the solvation delay is a minimum of a few seconds, with no upper limit, prepared using a crosslinking agent in an amount from 0.01 to 0.1 mole per mole of cellulose ether. Thus, the claims taken together with the specification imply that, by reacting the recited amount of crosslinking agent with a cellulose ether, crosslinked cellulose ethers having solvation delay from a minimum of a few seconds, with no upper limit, up to an apparently infinite time frame can be obtained.

*(3) The state of the prior art and (4) the predictability or unpredictability of the art:*

Menkart et al. (US 3,072,635, January 8, 1963, of record) teaches that, when using dialdehydes to crosslink cellulose ethers, small amounts of aldehyde treating

Art Unit: 1623

agent should be used, from about 0.005 to 5 weight percent based on the weight of the cellulose derivative. The amount of aldehyde should not be so great that cross-linkages are formed to such an extent that the solubility of the cellulose derivative is materially impaired [column 4, line 66 – column 5, line 8]. The crosslinked products of Menkart's examples dissolved in water within a few minutes [column 5, Example 1]. Thus, the skilled artisan could conclude that the use of large amounts of crosslinking agent leads to products for which solubility is impaired, and that the use of crosslinking agents in the amounts taught by Menkart leads to products which dissolve within a few minutes.

*(6) The amount of direction or guidance presented and (7) the presence or absence of working examples:*

The specification has provided guidance for products having a solvation delay of up to 5 minutes. However, the specification does not provide working examples or guidance for products having an unlimited solvation delay. Based on the teachings of Menkart et al., the skilled artisan would have reason to doubt whether a product having solvation delay of more than a few minutes could be prepared using only 0.1 to 0.1 molar equivalents of crosslinking agent.

*(8) The quantity of experimentation necessary:*

Considering the state of the art as discussed by the references above, particularly with regards to the teachings of Menkart et al. and the high unpredictability in the art as evidenced therein, and the lack of guidance provided in the specification, one of ordinary skill in the art would be burdened with undue experimentation to practice the invention commensurate in the scope of the claims.

***Response to Arguments***

Applicant argues that the amendment of claim 1 to recite "a minimum of a few seconds" overcomes the rejection. However, "a minimum of a few seconds" has no upper limit and includes much longer times - up to and beyond a plurality of hours. Thus, the rejection is maintained.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4, 6-9, 11, 12, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Menkart et al. (US 3,072,635, January 8, 1963, of record) in view of Block (US 4,366,070, December 28, 1982, of record).

Menkart et al. teach a method for producing cellulose derivatives with improved water solubility, comprising treating a cellulose ether with glyoxal [column 1, lines 37-49]. Cellulose ethers such as methyl hydroxyethyl cellulose, ethyl hydroxyethyl cellulose, and others may be used [column 2, lines 10-30]. Particles of the usual range and size of commercial products, between 20 and 350 mesh, are preferred [column 3, lines 1-3]. The glyoxal can be dissolved in a solvent such as acetone, methanol, or water, the cellulose derivative suspended therein with agitation for less than 30 minutes, followed by separation of the liquid to give a solid containing about 20 to 80 percent of



Art Unit: 1623

an adsorbed solution, followed by oven drying about 100°C, during which the reaction takes place [column 3, lines 14-47]. Another method involves spraying the crosslinking agent onto a mass of particles of moist carboxymethylcellulose which is being subjected to a mixing action [column 3, lines 49-55]. In one example, the reaction takes place over about 30 minutes [column 5, Example 1]. Glyoxal can be used in an amount of 0.001 to 0.2 moles per mole of cellulose derivative [claim 1] or about 0.02-0.5 weight percent [column 5, line 32]. The use of large amounts of crosslinking agent is to be avoided, because it leads to impaired solubility [column 5, lines 3-8]. The products of this method disperse in cold water without forming lumps and dissolve within 15 to 20 minutes [column 3, lines 43-48]. In one example, the product was pulverized after drying [column 6, Example 4]. Although Menkart et al. do not address the reversibility of the reaction, the skilled artisan would understand that the reaction of an alcohol and an aldehyde to form a hemiacetal is a reversible one.

Menkart et al. do not teach a reaction with a chemical compound having at least one acid group and at least one aldehyde group, or glyoxylic acid in particular. Menkart does not teach comminuting and milling before reaction.

Block teaches a cross-linked hydroxyalkyl cellulose reaction product for use in aqueous systems [see abstract]. The product is formed by contacting a hydroxyalkyl cellulose with a cross-linking agent which can be glyoxylic acid or glyoxal [column 5, lines 6-35], and can be carried out at ambient temperatures or from about 50°C to 100°C [column 5, lines 63-68]. The crosslinked products are used in aqueous systems [column 10, lines 9-12].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute glyoxylic acid for glyoxal in the method of Menkart et al. The Supreme Court in KSR reaffirmed the familiar framework for determining obviousness as set forth in *Graham v. John Deere Co.* (383 U.S. 1, 148 USPQ 459 (1966)), but stated that the Federal Circuit had erred by applying the teaching-suggestion-motivation (TSM) test in an overly rigid and formalistic way. KSR, 82 USPQ2d 1385. Exemplary rationales that may support a conclusion of obviousness include:

- Combining prior art elements according to known methods to yield predictable results;
- Simple substitution of one known element for another to obtain predictable results;
- Use of known technique to improve similar devices (methods, or products) in the same way;  
Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
- "Obvious to try" – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success.
- Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;
- Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

The instant case could be considered either simple substitution of one known element for another or "obvious to try." Menkart teaches a method which differs from the claimed method by the substitution of glyoxylic acid for glyoxal. Glyoxylic acid is known in the art for crosslinking cellulose ethers. Both Menkart and Block are concerned with producing crosslinked cellulose ethers for use in aqueous solutions; thus, the skilled artisan could have substituted one known element for another, and

Art Unit: 1623

could have predicted that the resulting product would be useful in aqueous solutions. Menkart also teaches that there is a recognized problem in the art (solubility of cellulose ethers) which could be solved by crosslinking the cellulose ethers. Block teaches a finite number of examples of crosslinking agents which can be used to prepare crosslinked cellulose ethers which are suitable for use in aqueous solutions. One of ordinary skill in the art could have pursued the potential solutions (crosslinking agents) taught by Block with a reasonable expectation of success. Further, although Menkart does not teach the steps of comminuting, milling, and drying, Menkart does teach a drying step, does teach pulverization of the product after drying and does teach a desirable particle size. It has been held that merely reversing the order of steps in a multi-step process is not a patentable modification absent unexpected or unobvious results. Ex parte Rubin, 128 U.S.P.Q. 440 (P.O.B.A. 1959). Cohn v. Comr. Patents, 251 F. Supp. 437, 148 U.S.P.Q. 486 (D.C. 1966).

### ***Response to Arguments***

Applicant argues that formation of an ester group was surprising because the hydroxy group on cellulose ether is not considered readily accessible for cross-linking agents containing carboxy groups. This argument is not persuasive because Block explicitly suggests crosslinking a cellulose ether with glyoxylic acid, as set forth above.

Applicant argues that Menkart does not teach the solvation delay of the compounds, and that Menkart's general reference to the time required to obtain a clear solution is not the same thing as solvation delay. Menkart does not explicitly refer to

"solvation delay." Since the Office does not have the facilities for preparing the claimed materials and comparing them with prior art inventions, the burden is on Applicant to show a novel or unobvious difference between the claimed product and the product of the prior art. See *In re Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977) and *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980). It is noted that the claimed range of "at least a few seconds" with no upper limit is very broad.

Applicant argues that Menkart does not teach pre-moistening the cellulose ether with 40-80% water or 30-60% organic suspension medium prior to admixing. Menkart does teach that cellulose having an average moisture content of at least 10% should be used to provide good contact between the cellulose ether and the aldehyde treating agent. Menkart also teaches that the cellulose derivative can be suspended in a solvent with agitation for 30 minutes or less, and then the liquid separated to provide a solid containing about 20-80% of adsorbed solution. The solvent can be water, acetone, methyl ethyl ketone, methanol, ethanol, or propanol [column 3, lines 4-48]. In one example, carboxymethylcellulose containing 38% water was used [column 6, Example 5]. Thus, Menkart clearly teaches the use of moistened cellulose and teaches the use of cellulose containing adsorbed solvent. The skilled artisan could use the guidance provided by Menkart to determine the optimum amounts of solvent to use.

Applicant argues that Menkart does not teach the steps of comminuting and milling the admixed cellulose ether composition. This argument is not persuasive because Menkart does teach subjecting the cellulose ether composition to a mixing action [column 3, lines 55] or tumbling motion [column 7, line 4]. Thus, Menkart

provides guidance for methods to thoroughly mix the cellulose ether and crosslinking agent. Menkart also provides guidance for appropriate particle size of the starting cellulose ethers. Applicant argues that milling and comminuting, a different method for thoroughly mixing the cellulose ether and crosslinking agent, results in a greater uniformity in crosslinking. Note that arguments of counsel cannot take the place of factually supported objective evidence. See, e.g., *In re Huang*, 100 F.3d 135,139-40, 40 USPQ2d 1685, 1689 (Fed. Cir. 1996); *In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984). The burden is shifted to Applicant to show factually supported objective evidence to rebut the prima facie case of obviousness over the prior art.

Applicant argues that crosslinked cellulose alone does not impart suitable rheology to Block's well drilling fluids. The relevancy of this argument is unclear since the instant claims are drawn to a method for preparation of crosslinked cellulose ethers. Block teaches crosslinking agents which may be used for crosslinking of cellulose ethers. Thus, the skilled artisan would look to Block for guidance for crosslinking cellulose ethers. Further, both Block and Menkart are drawn to the production of crosslinked cellulose ethers as viscosifiers for aqueous solutions, and thus are not different fields of endeavor.

Applicant argues that Block teaches a "generic laundry list" of crosslinking agents. This argument is not persuasive because Block's claim 2 recites a finite list of crosslinking agents, including glyoxylic acid.

Applicant's argument with respect to the solvation delay of Block's product is substantially the same as that addressed above.

Applicant's argument that Block does not teach methods in which the cellulose ether is not dissolved in the water or suspension medium, or pre-moistened with water or organic suspension medium, is not persuasive in view of the teachings of Menkart.

Applicant's argument that formation of an irreversible ester group was surprising to those skilled in the art was addressed above.

Applicant's argument that Block does not teach comminuting and milling of the composition prior to crosslinking is substantially the same as that addressed above.

### ***Conclusion***

No claims are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAYLA BLAND whose telephone number is (571)272-9572. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anna Jiang can be reached on (571) 272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Layla Bland/  
Examiner, Art Unit 1623

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Supervisory Patent Examiner  
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